

No.



201400177

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Monsanto Technology LLC

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, a copy of which is hereunto annexed and made a part hereof, and the various requirements of LAW in such cases made and provided have been complied with, and the title thereto is, from the records of the PLANT VARIETY PROTECTION OFFICE, in the applicant(s) indicated in the said copy, and Whereas, upon due examination made, the said applicant(s) is (are) adjudged to be entitled to a certificate of plant variety protection under the LAW.

Now, therefore, this certificate of plant variety protection is to grant unto the said applicant(s) and the successors, heirs or assigns of the said applicant(s) for the term of TWENTY years from the date of this grant, subject to the payment of the required fees and periodic replenishment of viable basic seed of the variety in a public repository as provided by LAW, the right to exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety therefrom, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'T3997'



Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fourteenth day of August, in the year two thousand and fifteen.*

Secretary of Agriculture

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Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE <i>(Instructions and information collection burden statement on reverse)</i>		<i>The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.</i> <i>Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).</i>	
1. NAME OF OWNER Monsanto Technology LLC		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME	3. VARIETY NAME T3997
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 800 N. Lindbergh Blvd. St. Louis, MO 63167 USA		5. TELEPHONE (include area code) 815-758-9281	FOR OFFICIAL USE ONLY PVPO NUMBER 201400177
		6. FAX (include area code) 815-758-3117	FILING DATE January 17, 2014
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Limited Liability Corporation	8. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware	9. DATE OF INCORPORATION March 2, 2000	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Timothy R. Kain 8350 Minnegan Rd, Waterman, IL 60556 Chunping Li 700 Chesterfield Parkway West, Chesterfield, MO 63017		11. TELEPHONE (Include area code) 815-758-9281	FILING AND EXAMINATION FEES: \$ 4382.00 DATE 1/17/2014
		12. FAX (Include area code) 815-758-3117	CERTIFICATION FEE: \$ DATE
13. E-MAIL trkain@monsanto.com			
14. CROP KIND (Common Name) Field Corn	15. GENUS AND SPECIES NAME OF CROP Zea mays	16. FAMILY NAME (Botanical) Graminae	
17. IS THE VARIETY A FIRST GENERATION HYBRID? <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> NO	18. DOES THE VARIETY CONTAIN ANY TRANSGENES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input checked="" type="checkbox"/> NO (If "no", go to item 23) <input type="checkbox"/> UNDECIDED	
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), <input checked="" type="checkbox"/> Make checks and money orders payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) <input checked="" type="checkbox"/> Credit Card Payments (See Instructions on Page 2 of 10)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. ____ FOUNDATION ____ REGISTERED ____ CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
25. The owners declare that a viable sample of basic seed will be furnished directly to an acceptable depository in support of the variety within three months of filing. Seed will be replenished upon request in accordance with such regulations as may be applicable. For a tuber propagated variety or vegetative propagated parent of the variety, a tissue culture or vegetative sample will be deposited in a public repository within three months of the date of the certificate fee request letter. These will be maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.		24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
SIGNATURE OF OWNER 		SIGNATURE OF OWNER	
NAME (Please print or type) Timothy R. Kain		NAME (Please print or type)	
CAPACITY OR TITLE Patent Scientist	DATE 16 Jan 2014	CAPACITY OR TITLE	DATE

dbc 02/24/2015

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22. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

23. CONTINUED FROM FRONT *(Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)*

Corn inbred parent line of hybrid sold in the U.S. - April 15, 2013

24. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

United States Patent Application filed on May 9, 2013 - Application Number: 13/890,994

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE EXHIBIT A - ORIGIN AND BREEDING HISTORY <small>** Use additional pages as needed.</small>		FOR OFFICIAL USE ONLY <hr/> PVPO NUMBER 201400177
1. Name of Owner Monsanto Technology LLC	2. Temporary Designation or Experimental Name	3. Variety Name T3997
4. Describe the genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s). ** The cross between CV107099 as seed parent in plot#15168 and I226211 in plot#15167 was made in Mexico Set B-P49-XD-16. Both of these parents are Monsanto proprietary lines.		
5. Give the details of subsequent stages of selection and multiplication. **		
Year	Detail of Stage	Selection Criteria
	See attached Origin and Breeding History	T3997 was selected for combining ability yield with plant health.
6. Is the variety uniform? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No How did you test for uniformity? Corn inbred T3997 was coded in the fall of 2008 with final selection made in summer of 2009. This inbred has been reproduced by self pollination both summer and winter since then and is judged to be stable. Inbred T3997 is uniform for all traits observed.		
7. Is the variety stable? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No How did you test for stability? Over how many generations? Corn inbred T3997 was coded in the fall of 2008 with final selection made in summer of 2009. This inbred has been reproduced by self pollination for 2 generations and is judged to be stable. Inbred T3997 is uniform for all traits observed.		
8. Are genetic variants observed or expected during reproduction and multiplication? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, state how these variants may be identified, their type and frequency: T3997 shows no variants other than what would normally be expected due to environment or that would occur for almost any character during the course of repeated sexual reproduction.		

EXHIBIT AOrigin and Breeding HistoryT3997

T3997 was selected for combining ability yield with plant health.

2004-10	The cross between CV107099 as seed parent in plot#15168 and I226211 in plot#15167 was made in Mexico Set B-P49-XD-16. Both of these parents are Monsanto proprietary lines.
2005-06	The F1 was induced for to produce haploid seed in the Hawaii June induction nursery K25-MOL-KHI1-31, set K25-KHI1-16, rows 5911-5934.
2006-01	The treated haploids were selfed in the Hawaii Doubling Nursery 06 01 31 31 HIKI0904FY06-0376_00004_00003_78_.
2007-04	The DH1 was selfed in Set SC1-16, AbsR-130, AbsC-3, plot#112350
2007-10	The DH2 was selfed in Mexico set N-P45-XS-16, AbsR-40, AbsC-12, plot# 74011.
2008-04	The DH3 was selfed in Greenville Set Sc2-16, AbsR-322, AbsC-264, plot#111577. In the Fall 3 F6 ears were selected from this row and coded as T3997.
2008-10	The DH4 was selfed ear-to-row in Hawaii Set B-X47-SS-16. F7 Ears were selected from AbsR-40, AbsC 36-38.
2009-04	The DH5 was selfed in 16 rows in Greenville nursery set PS1_INC Plots 21138-21153. The inbred seed was judged to be uniform across and within rows and bulked at harvest to constitute T3997.

Statement of Stability and Uniformity

Corn inbred T3997 was coded in the fall of 2008 with final selection made in summer of 2009. This inbred has been reproduced by self pollination both summer and winter since then and is judged to be stable. Inbred T3997 is uniform for all traits observed.

Statement of Variants

T3997 shows no variants other than what would normally be expected due to environment or that would occur for almost any character during the course of repeated sexual reproduction.

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE		FOR OFFICIAL USE ONLY PVPO NUMBER <div style="border: 1px solid black; padding: 10px; margin: 5px auto; width: 150px;">201400177</div>	
EXHIBIT B – STATEMENT OF DISTINCTNESS ** Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.			
1. Name of Owner Monsanto Technology LLC	2. Temporary Designation or Experimental Name	3. Variety Name T3997	
Based on overall morphology, <u>T3997</u> is most similar to <u>I294213</u> <u>T3997</u> most clearly			
<i>Applicant's new variety</i> <i>Most similar comparison variety(ies)</i> <i>Applicant's new variety</i>			
differs from <u>I294213</u> in the following traits Name the specific trait. Then list the value of that trait for each variety in the comparison.			
Submit <i>Most similar comparison variety(ies)</i>			
appropriate supporting evidence (see the Guidelines for Presenting Evidence in Support of Variety Distinctness in the instructions):			
	<i>Eg. Leaf Pubescence</i> <i>Eg. Leaf Color</i> <i>Eg. Plant Height</i>	<i>heavy pubescence</i> <i>Dark Green (5GY 3/4)</i> <i>200 cm +/- 10 cm (N=25)</i>	<i>glabrous</i> <i>Light Green (2.5GY 8/10)</i> <i>250 cm +/- 15 cm (N=25)</i> <i>photograph attached</i> <i>Munsell Color Chart</i> <i>statistics attached</i>
	1. Qualitative traits:	2. Color traits:	3. Quantitative traits:
Application Variety		Anther Color: Pink (2.5R 7/6)	Internode Length: 13.3cm +/- 1.1cm (N=15) Leaf Width: 8.6cm +/- 0.5cm (N=15) Leaf Length: 80.1cm +/- 3.8cm (N=15) Kernel Length: 11.0mm +/- 0.8mm (N=15) Kernel Thickness: 5.0mm +/- 0.4mm (N=15)
Comparison Variety 1		Anther Color: Purple (5RP 5/8)	Internode Length: 12.3cm +/- 0.7cm (N=15) Leaf Width: 9.4cm +/- 0.7cm (N=15) Leaf Length: 71.7cm +/- 3.4cm (N=15) Kernel Length: 11.4mm +/- 0.7mm (N=15) Kernel Thickness: 4.3mm +/- 0.3mm (N=15)
Comparison Variety 2			
Comparison Variety 3			

**** Use additional tables to present clear differences for additional comparison varieties. Use additional pages to present supporting evidence.**

EXHIBIT BStatement of Distinctness

Monsanto Technology LLC believes that Corn Variety T3997 is most similar to Corn Variety I294213, (PVP No. 200400018) a proprietary Monsanto Technology LLC corn variety.

Corn Variety T3997 differs from Corn Variety I294213 at the following traits:

Year	Name	Internode Length (cm)	Leaf Width (cm)	Leaf Length (cm)	Tassel Branch Number	Kernel Length (mm)	Kernel Thickness (mm)
2011	T3997	13.3	8.6	80.1	2.9	11	5
	I294213	12.3	9.4	71.7	5.9	11.4	4.3
	Std. Dev_1	1.1	0.5	3.8	1.6	0.8	0.4
	Std. Dev_2	0.7	0.7	3.4	2.1	0.7	0.3
	Sample_1	15	15	15	15	15	15
	Sample_2	15	15	15	15	15	15
	P_Val	0	0	0	0	0.1	0
	Sig	**	**	**	**	+	**
Year	Name	Internode Length (cm)	Leaf Width (cm)	Leaf Length (cm)	Tassel Branch Number	Kernel Length (mm)	Kernel Thickness (mm)
2012	T3997	15.9	7.4	75.3	3.8	10.3	4.7
	I294213	12.2	8.9	69.3	4.9	11.4	4.3
	Std. Dev_1	1.2	0.4	4.6	1.7	0.5	0.3
	Std. Dev_2	0.5	0.5	4.9	0.7	0.5	0.3
	Sample_1	15	15	15	15	15	15
	Sample_2	15	15	15	15	15	15
	P_Val	0	0	0	0.02	0	0
	Sig	**	**	**	*	**	**

Significance levels are indicated as: + = 10%, * = 5 %, ** = 1%

Trait	T3997	I294213
Anther Color	Salmon (3)	Purple (9)

Corn variety T3997 has a longer internode length, a smaller leaf width, larger leaf length, fewer tassel branches, a shorter kernel length, and a larger kernel thickness as compared to similar corn variety I294213. In addition, corn variety T3997 has salmon anther color whereas similar corn variety I294213 has purple anther color.

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**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

Exhibit C

**OBJECTIVE DESCRIPTION OF VARIETY
Corn (*Zea mays* L.)**

NAME OF APPLICANT(S) Monsanto Technology LLC	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME T3997
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country) 8350 Minnegan Road Waterman, IL 60556 USA		FOR OFFICIAL USE ONLY PVPO NUMBER 201400177

In the spaces on the left, enter the appropriate numbers that describe the characteristics of the application variety. On the right, enter the appropriate numbers that describe the characteristics of the most similar comparison variety. Right justify whole numbers by adding leading zeros if necessary. The variety that you choose for comparison should be the most similar one in terms of overall morphology, background, genetics, and maturity.

In general, for this form, measurements of quantitative traits should be taken in **one trial on 15-25 randomly selected plants** to obtain averages and statistics that describe a typical field of the variety. Trials should be done preferably in one location, with replicates, in the region of best adaptability (where the variety will grow and perform to its best potential). Trials should include the application variety plus all comparison varieties.

At least one year of trials should be conducted within the United States of America. (Form technical content last updated Dec. 2008.)

The following historical STANDARD INBRED LINES are available from the North Central Regional Plant Introduction Station in Ames, Iowa. They have been well characterized and may be used as comparison varieties. If used, then use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data.

Yellow Dent Families:

Family	Members
B14	CM105, A632, B64, B68
B37	B37, B76, H84
B73	N192, A679, B73, NC268
C103	Mo17, Va102, Va35, A682
Oh43	A619, MS71, H99, Va26
WF9	W64A, A554, A654, Pa91

Yellow Dent (Unrelated):

Co109, ND246
Oh7, T232
W117, W153R
W182BN

White Dent:

Cl66, H105, Ky228

Sweet Corn:

C13, Iowa5125, P39, 2132

Popcorn:

SG1533, 4722, HP301, HP7211

Pipcorn:

Mo15W, Mo16W, Mo24W

Describe the Region of Best Adaptability, trial set-up, and the environmental conditions (including monthly temperatures and rainfall) during the trial (continue in Comment Section).

Description of Trial set-up and environmental conditions provided in Exhibit D.

1. TYPE: 5 1 = Flint 2 = Flint-like 3 = Intermediate 4 = Dent-like 5 = Dent			Comparison Variety Name: I294213 Type 5		
2. MATURITY (In Region Best Adaptability: show Heat Unit Formula in Comments section):					
DAYS	HEAT UNITS		DAYS	HEAT UNITS	
82	1466	From planting to 50% of plants in silk	79	1390	50% Silk
80	1414	From planting to 50% of plants in pollen	79	1390	50% Pollen
Application Variety Data			Comparison Variety Data		

Application Variety Data				Comparison Variety Data			
3. PLANT:				Mean	Standard Deviation	Sample Size	
218.8	cm Plant Height (to tassel tip)	6.0	15	199.3	cm Plant Height	8.6	15
69.7	cm Ear Height (to base of top ear node)	4.1	15	66.0	cm Ear Height	6.2	15
15.9	cm Length of Top Ear Internode	1.2	15	12.2	cm Internode	0.5	15
5 Anthocyanin of Brace Roots (when brace roots are green with some red or purple anthocyanin in stripes or speckles, rate the shade of anthocyanin) 1 = Absent (Green) 3 = Weak (Pink) 5 = Medium (Light red; Light red/purple) 7 = Strong (Red; Red/purple) 9 = Very Strong (Dark red/purple)				5 Brace Root Anthocyanin			
4. LEAF:				Mean	Standard Deviation	Sample Size	
7.4	cm Width of Ear Node Leaf	0.4	15	8.9	cm Leaf Width	0.5	15
75.3	cm Length of Ear Node Leaf	4.6	15	69.3	cm Leaf Length	4.9	15
1 Leaf Attitude from main stem to tip of leaf (see UPOV diagrams) 1 = Erect 3 = Horizontal 5 = Drooping				1 Leaf Attitude			
2 Pubescence on margin/edge of leaf sheath (Rate on scale from 1 = none to 9 = like peach fuzz)				4 Pubescence on margin/edge of leaf sheath			
5. TASSEL:				Mean	Standard Deviation	Sample Size	
3.8	Number of Primary Lateral Branches	1.7	15	4.9	No. Tassel Branches	0.7	15
39.8	cm Tassel Length (From top node below flag leaf to tassel tip)	3.9	15	37.2	cm Tassel Length	3.4	15
12.2	cm Tassel Peduncle Length (From top node below flag leaf to bottom tassel branch)	3.8	15	7.6	cm Peduncle Length	2.2	15
23.0	cm Tassel Central Spike Length (From top tassel branch to tassel tip)	1.8	15	20.9	cm Central Spike Len	1.9	15
1 Branch Attitude from Central Spike from main spike to tip of tassel branch (see UPOV diagrams): 1 = Erect 3 = Horizontal 5 = Drooping				1 Tassel Branch Attitude			
3 Anther Color (2-3 days after being exposed to allow for sun reddening effects) 1 = Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5 = Red (ex. Munsell 2.5R 4/8) 7 = Dark Red (ex. Munsell 10RP 4/8) 9 = Purple (ex. Munsell 5RP 5/8)				9 Anther Color			
1 Glume Color (on the top 2/3 of the glume) 1 = Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5 = Red (ex. Munsell 2.5R 4/8) 7 = Dark Red (ex. Munsell 10RP 4/8) 9 = Purple (ex. Munsell 5RP 5/8)				1 Glume Color			
1 Bar Glume Anthocyanin Color (on the bottom 1/3 of glume; see UPOV Diagram; Note: the bar glume is listed as "present" if it is present and the ring is at least 50% closed) 1 = Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3 = Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5 = Red (ex. Munsell 2.5R 4/8) 7 = Dark Red (ex. Munsell 10RP 4/8) 9 = Purple (ex. Munsell 5RP 5/8)				1 Bar Glume Anthocyanin Color			
Application Variety Data				Comparison Variety Data			

Application Variety Data				Comparison Variety Data			
6a. EAR (Unhusked Data):				Mean			
		Standard Deviation	Sample Size		Standard Deviation	Sample Size	
2.2	cm Husk Extension (at harvest)	0.9	15	3.6	cm Husk Extension	1.1	15
23.2	cm Husk Leaf Length	1.0	15	22.9	cm Husk Leaf Len	1.2	15
3 Silk Color (2-3 days after emergence to allow for sun reddening effects) 1= Green or Yellow (ex. Munsell Code 2.5GY 8/6 or 10Y 8.5/6) 3= Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 5= Red (ex. Munsell 2.5R 4/8) 7= Dark Red (ex. Munsell 10RP 4/8) 9= Purple (ex. Munsell 5RP 5/8)				3 Silk Color			
6b. EAR (Husked Ear Data):				Mean			
		Standard Deviation	Sample Size		Standard Deviation	Sample Size	
18.8	cm Ear Length	0.7	15	17.1	cm Ear Length	0.8	15
40.6	mm Ear Diameter at mid-point	1.8	15	41.8	mm Ear Diameter	1.6	15
224.9	gm Ear Weight			243.4	gm Ear Wt		
17.3	Number of Kernel Rows	1.4	15	17.2	No. Kernel Rows	1.0	15
33.3	Number of Kernels per Row	2.3	15	32.3	No. Kernels per Row	2.1	15
7.9	cm Shank Length	0.9	15	7.3	cm Shank Length	0.6	15
7. KERNEL (Dried):				Mean			
		Standard Deviation	Sample Size		Standard Deviation	Sample Size	
10.3	mm Kernel Length	0.5	15	11.4	mm Kernel Length	0.5	15
7.8	mm Kernel Width	0.5	15	7.7	mm Kernel Width	0.4	15
2 Hard Endosperm Color 1= White (ex. Munsell Code 5Y 9/1 or 2.5Y 8.5/2) 2= Yellow (ex. Munsell Code 2.5Y 8/10 or 7.5YR 7/14) 3= Other (specify _____)				2 Hard Endosperm Color			
1 Endosperm Type: 1 = Normal Starch 3 = Waxy Starch 5 = High Lysine 7 = Other _____				1 Endosperm Type			
189.3 ^{37.7} gm Weight per 100 Kernels (unsized sample)				213.5 ^{42.7} gm Kernel Wt.			
8. COB:				Mean			
		Standard Deviation	Sample Size		Standard Deviation	Sample Size	
21.6	mm Cob Diameter at mid-point	1.2	15	21.1	mm Cob Diameter	1.0	15
3 Cob Color 1= White (ex. Munsell 5Y 9/1 or 2.5Y 8.5/2) 2= Pink (ex. Munsell 2.5R 7/6 or 5R 5/6) 3= Red (ex. Munsell 2.5R 4/8 or 10RP 4/8) 4= Other (describe _____)				3 Cob Color			
9. DISEASE RESISTANCE of the variety per se: Name the disease, the causative organism, the races or strains, and the resistance rating (rate from 1 (most susceptible) to 9 (most resistant). Trials should be conducted with resistant and susceptible check varieties, and ensure that adequate disease pressure is present in the trial (such as with inoculations or heavy disease pressure). EXAMPLE: <u>7</u> Helminthosporium Leaf Spot (<i>Bipolaris zeicola</i>) Race <u>2</u>				DISEASE RESISTANCE of the comparison variety per se: Rate the same diseases as tested for the application variety.			
Application Variety Data				Comparison Variety Data			

EXHIBIT D

The corn varieties T3997 and I294213 were grown at the Waterman, IL observation nursery in years 2011 - 2012. The varieties were planted in 2 row plots with 15 plants per row in each of the two years. Trait data were collected on 15 random representative plants for most traits from each 2 row plot. Data on qualitative traits are usually collected on 15 plants from each 2 row plot. For Exhibit C all data were reported as means for one year for subject variety and the standard variety with standard deviation. The varieties are randomly planted in a 4.5 acre observation nursery which is located within a larger 18 acre field. Besides the observation nursery, this field consists of a research seed increase nursery and an IP seed inventory nursery. The location of each of these individual nurseries is rotated each year to a different location within the 18 acre field. Therefore subject inbreds are not planted adjacent to comparative or standard varieties and may be located in different areas of the larger field each year, therefore being influenced by spatial differences within the field. Growing conditions within the field are not uniform as there are some slight topographical variations such as lower areas which may accumulate and retain water or higher areas which are usually drier. The field is tiled and therefore a variety maybe planted close to a tile line while a comparative variety maybe planted further away and in a low spot within the field. Temporal variations can exist as weather conditions from year to year can vary as well as planting dates can vary from year to year based on weather conditions. Weather conditions each year can vary the maturity rate of the varieties due to either favorable or unfavorable growing conditions.

Trait variability is not observed for each variety within its own test plot-plants are usually uniform and data are collected on the "most" representative plants- variability occurs due to spatial location of the test plot for that variety from year to year and to the temporal variation of weather conditions from year to year during the two years data are collected.

Waterman Research Station
Monthly Weather Data
2011 - 2012

Month	Average Precip. (inch)	Ave. Monthly Temp - Max. (F°)	Ave. Monthly Temp - Min (F°)	Ave. Monthly Rel. Humid - Max (%)	Ave. Monthly Rel. Humid - Min (%)
April 2011	3.7	55.6	37.1	90.2	52.2
May 2011	4.2	69.7	48.0	89.2	49.1
June 2011	3.7	79.4	59.7	89.8	51.4
July 2011	4.4	87.3	66.8	89.7	46.6
August 2011	3.7	81.7	60.4	93.0	50.4
September 2011	3.1	70.2	50.0	92.6	50.3
April 2012	2.4	60.1	37.2	84.6	42.3
May 2012	1.0	76.7	52.0	82.4	40.7
June 2012	1.7	82.1	58.5	85.8	41.7
July 2012	2.7	90.4	67.0	89.3	40.6
August 2012	1.8	83.1	58.0	91.6	48.7
September 2012	1.7	75.5	49.0	92.7	41.2

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE EXHIBIT E - STATEMENT OF THE BASIS OF OWNERSHIP		FOR OFFICIAL USE ONLY PVPO NUMBER 201400177
1. Name of Owner Monsanto Technology LLC	2. Temporary Designation or Experimental Name	3. Variety Name T3997
4. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain.		
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
5. Is the applicant a U.S. national or a U.S. based entity? If no, give name of country.		
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
6. Is the applicant the original owner?		
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If no, please answer <u>one</u> of the following:		
a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?		
<input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country		
b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?		
<input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country		
7. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):		
<p>Corn Variety T3997 was originated and developed by a breeder employed by Monsanto Technology LLC. By agreement between Monsanto Technology LLC and the breeder, all rights to any invention, discovery, or development are assigned to Monsanto Technology LLC. No rights to such invention, discovery, or development are retained by the breeder.</p>		
PLEASE NOTE:		
Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:		
1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.		
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.		
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.		
The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.		